100. The purpose and scope of the conference shall be limited to issues involving the implementation of the response actions required by this Order and the extent to which Respondent intends to comply with this Order. This conference is not an evidentiary hearing, and does not constitute a proceeding to challenge this Order. It does not give Respondent a right to seek review of this Order, or to seek resolution of potential liability, and no official stenographic record of the conference will be made. At any conference held pursuant to Respondent's request, Respondent may appear in person or by an attorney or other representative.

101. Requests for a conference must be by telephone followed by written confirmation mailed that day to:

Sarah Flanagan
Assistant Regional Counsel
Office of Regional Counsel
U.S. Environmental Protection Agency
290 Broadway, 17th Floor
New York, N.Y. 10007-1866
Telephone: (212) 637-3136
Telecopy: (212) 637-3096

XXVII. NOTICE OF INTENT TO COMPLY

102. Respondent shall provide, not later than 14 days after the effective date of this Order, written notice to EPA's RPM and Assistant Regional Counsel for the Site stating whether it will comply with the terms of this Order. If Respondent does not unequivocally commit to perform the Work as provided by this Order, it shall be deemed to have violated this Order and to have failed or refused to comply with this Order. Respondent's written notice(s) shall describe, using facts that exist on or prior to the effective date of this Order, any "sufficient cause" defenses asserted by Respondent under Sections 106(b) and 107(c)(3) of CERCLA. The absence of a response by EPA to the notice required by this paragraph shall not be deemed to be acceptance of Respondent's assertions.

XXVIII. TERMINATION AND SATISFACTION

103. This Order will be terminated by EPA if Respondent demonstrates in writing and certifies to the satisfaction of EPA that all Work and activities required under this Order, including any additional work required by EPA, have been performed fully in accordance with this Order and EPA has approved the certification in writing. Such an approval by EPA, however, shall not relieve Respondent of any remaining obligations under the Order, including those requirements set forth in Section XVIII regarding record preservation. Respondent's written submission under this paragraph shall include a certification

statement, signed by a responsible corporate official of Respondent or Respondent's Project Coordinator, which states the following:

> "To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete."

So Ordered, this ___ day of _____, 2007.

By: _____
GEORGE PAVLOU

Director, Emergency and Remedial Response Division
Region 2
U.S. Environmental Protection Agency

statement, signed by a responsible corporate official of Respondent or Respondent's Project Coordinator, which states the following:

> "To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete."

So Ordered, this 27 day of December, 2007.

By: _____
GEORGE PAVLOU

Director, Emergency and Remedial Response Division
Region 2
U.S. Environmental Protection Agency

APPENDIX A

STATEMENT OF WORK FOR
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
CROWN VANTAGE LANDFILL SUPERFUND SITE
Alexandria Township, Hunterdon County, New Jersey

I. INTRODUCTION

A. The purpose of this remedial investigation/feasibility study ("RI/FS") is to investigate the nature and extent of contamination at the Crown Vantage Landfill Site (the "Site"), and develop and evaluate potential remedial alternatives. The RI and FS are interactive and may be conducted concurrently so that the data collected in the RI influences the development of remedial alternatives in the FS, which in turn affects the data needs and the scope of treatability studies, if needed.

B. Respondent shall conduct this RI/FS and shall produce draft RI and FS reports that are in accordance with this statement of work, the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (U.S. EPA, Office of Emergency and Remedial Response, October 1988), and any other guidance that EPA uses in conducting a RI/FS, as well as any additional requirements in the Unilateral Administrative Order ("Order"). The RI/FS Guidance describes the report format and the required report content. Respondent shall furnish all necessary personnel, materials, and services needed for, or incidental to, the performance of the RI/FS, except as otherwise specified in the Order.

C. At the completion of the RI/FS, EPA will be responsible for the selection of the remedy for the Site and will document the remedy selection in a Record of Decision (ROD). The remedial action alternative selected by EPA will meet the cleanup standards specified in CERCLA Section 121. That is, the selected remedial action will be protective of human health and the environment, will be in compliance with, or include a waiver of, applicable or relevant and appropriate requirements of other laws, will be cost-effective, will utilize permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable, and will address the statutory preference for treatment as a principal element. The final RI/FS report, as adopted by EPA, and the baseline risk assessment will, with the administrative record, form the basis for the selection of the remedy for the Site and will provide the information necessary to support the development of the ROD.

D. As specified in CERCLA Section 104(a) (1), as amended by SARA, EPA will provide oversight of Respondent's activities throughout the RI/FS. Respondent shall support EPA's initiation and conduct of activities related to the implementation of oversight activities.

II. TASK I - RI/FS WORK PLAN

A. The RI/FS is conducted to gather sufficient data and information necessary to characterize the nature and extent of contamination in order to support the selection of a remedy

for the Site that will reduce or eliminate risks to human health or the environment associated with contamination at the Site. Respondent shall follow "Data Quality Objectives Process for Hazardous Waste Site Investigations," EPA QA/G-4HW, January 2000, in planning and conducting the RI/FS.

B. The RI/FS achieves its objectives by determining the horizontal and vertical distribution and concentration of hazardous substances at or attributable to the Site, in the soil, in surface and ground water, sediment, and other potentially affected media.

C. Before planning RI/FS activities, all existing data for the Site will be thoroughly compiled and reviewed by Respondent. This data includes, but is not limited to, the results of previous investigations of the site, historical information about the site, including aerial photographs, and other available information.

D. Respondent will conduct a visit to the Site during the scoping phase of the project to assist in developing a conceptual understanding of sources and areas of contamination as well as potential exposure pathways and receptors at the Site. During the visit to the Site, Respondent should observe the Site's physiography, hydrology, geology, and demographics, as well as natural resource, ecological, and cultural features. This information will be utilized to better scope the project and to determine the extent of additional data necessary to characterize the Site, and better define potential applicable or relevant and appropriate requirements (ARARs).

E. Once Respondent has collected and analyzed existing data and conducted a visit to the Site, the specific project scope will be planned. Project planning activities include those tasks described below as well as identifying data needs, developing a work plan, designing a data collection program, and identifying health and safety protocols.

F. Within forty-five (45) days after the effective date of the Order, Respondent shall submit to EPA a preliminary conceptual site model (PCSM) to support the development of the RI/FS Work Plan. Respondent will meet with EPA and the State of New Jersey (the "State") to review the preliminary PCSM and to plan RI/FS activities before drafting the RI/FS Work Plan, sampling and analysis plan, and site health and safety plan. EPA may elect to provide comments on the PCSM, in which case Respondent shall amend and submit to EPA a revised PCSM, which is responsive to the directions in all EPA's written comments, within fourteen (14) days of receiving EPA's comments, or such longer time as specified by EPA.

G. RI/FS Work Plan and Schedule. Within seventy-five (75) days of EPA's written authorization to proceed based on the PCSM, Respondent shall submit to EPA a detailed Work Plan for the completion of the RI/FS. Available Site-related information, including, but not limited to, existing sampling data, information on the historical use of the Site, and other material that reflects the historical waste disposal practices at the Site, will be used for planning the RI/FS Work Plan. The RI/FS Work Plan shall include, among other things, a detailed schedule for RI/FS activities at the Site. The schedule shall provide for the completion of the RI/FS within thirty-six (36) months of EPA approval of the RI/FS Work Plan, or as otherwise extended by EPA. EPA will either approve the RI/FS Work Plan pursuant to Section XIV (EPA Approval of

Plans and Other Submissions) of the Order, or will provide comments on it. Within thirty (30) days of receiving comments from EPA on the RI/FS Work Plan, Respondent shall prepare a revised RI/FS Work Plan that is responsive to the directions in all EPA's written comments. Respondent shall submit the revised RI/FS Work Plan to EPA for approval pursuant to Section XIV (EPA Approval of Plans and Other Submissions) of the Order, unless Respondent is directed otherwise by EPA in writing. The RI/FS Work Plan shall include:

1. A Quality Assurance/Quality Control Project Plan (QAPP) which shall be prepared consistent with the Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP), Parts 1, 2 and 3, EPA-505-B-04-900A, B and C, March 2005 or newer, and other guidance documents referenced in the aforementioned guidance documents. The UFP documents may be found at: http://www.epa.gov/fedfac/documents/intergov_qual_task_force.htm. In addition, the guidance and procedures located in the EPA Region 2 DESA/HWSB web site: http://www.epa.gov/region02/qa/documents.htm, as well as other OSWER directives and EPA Region 2 policies should be followed, as appropriate.

   a. All sampling, analysis, data assessment, and monitoring shall be performed in accordance with the "Region II CERCLA Quality Assurance Manual," Revision 1, EPA Region 2, dated October 1989, and any updates thereto, or an alternate EPA-approved test method, and the guidelines set forth in the Order. All testing methods and procedures shall be fully documented and referenced to established methods or standards.

   b. The QAPP shall also specifically include the following items:

      i. An explanation of the way(s) the sampling, analysis, testing, and monitoring will produce data for the RI/FS phase;

      ii. A detailed description of the sampling, analysis, and testing to be performed, including sampling methods, analytical and testing methods, sampling locations and frequency of sampling;

      iii. A map depicting sampling locations (to the extent that these can be defined when the QAPP is prepared); and

      iv. A schedule for performance of specific tasks.

   c. In the event that additional sampling locations, testing, and analyses are required, Respondent shall submit to EPA an addendum to the QAPP for approval by EPA.

   d. In order to provide quality assurance and maintain quality control with respect to all samples to be collected, Respondent shall ensure the following:

i. Quality assurance and chain-of-custody procedures shall be performed in accordance with standard EPA protocol and guidance, including the guidance provided in the EPA Region 2 Quality Assurance Homepage, and the guidelines set forth in this Order.

ii. Once laboratories have been chosen, each laboratory's quality assurance plan (LQAP) should be submitted for review by EPA. In addition, the laboratory should submit to EPA current copies (within the past six months) of laboratory certification provided from either a State or Federal Agency which conducts certification. The certification should be applicable to the matrixes and analyses that are to be conducted. If the laboratory does not participate in the Contract Laboratory Program (CLP), it must submit to EPA the results of performance evaluation (PE) samples for the constituents of concern from within the past six months or it must complete PEs for the matrixes and analyses to be conducted and results must be submitted with the LQAP.

For any analytical work performed, including that done in a fixed laboratory, in a mobile laboratory, or in on-site screening analyses, Respondent must submit to EPA a "Non-CLP Superfund Analytical Services Tracking System" form for each laboratory utilized during a sampling event, within thirty (30) days after acceptance of the analytical results. Upon completion, such documents shall be submitted to the EPA Project Coordinator, with a copy of the form and transmittal letter to:

Regional Sample Control Center Coordinator
U.S. EPA Region 2
Division of Environmental Science & Assessment
2890 Woodbridge Avenue, Bldg. 209, MS-215
Edison, NJ 08837

iii. The laboratories utilized for analyses of samples must perform all analyses according to approved EPA methods.

iv. Unless indicated otherwise in the approved QAPP, upon receipt from the laboratory, all data shall be validated.

v. Submission of the validation package (checklist, report and Form I's containing the final data) to EPA, prepared in accordance with the provisions of Subparagraph vi. below as part of the RI Report submittal.

vi. Assurance that all analytical data that are validated as required by the QAPP are validated according to the latest version of EPA Region 2 data validation Standard Operating Procedures. Region 2 Standard Operating Procedures are available at: http://www.epa.gov/region02/qa/documents.htm,

vii. Unless indicated otherwise in the QAPP, Respondent shall require deliverables equivalent to CLP data packages from the laboratory for analytical data. Upon EPA's request, Respondent shall submit to EPA the full documentation (including raw data) for this analytical data. EPA reserves the right to perform an independent data validation, data validation check, or qualification check on generated data.

viii. Respondent shall insert a provision in its contract(s) with the laboratory utilized for analyses of samples, which will require granting access to EPA personnel and authorized representatives of the EPA for the purpose of ensuring the accuracy of laboratory results related to the Site.

2. A Field Sampling and Analysis Plan (FSP), which provides a detailed description of the sampling, analysis, and monitoring that shall be performed during the RI/FS phase, consistent with the Order. The FSP shall provide, at a minimum, for the collection of data sufficient to:

a. Delineate site-related contamination in potentially affected media, to the extent necessary to select an appropriate remedy;

b. Evaluate cross-media contaminant transport (e.g., ground water to surface water or soil to surface water) as necessary to support the assessment of risks associated with potential or actual exposures to site-related contamination under current and reasonably likely future conditions; and

c. Evaluate remedial alternatives to address site-related contamination.

3. A Health and Safety Plan (HSP), which shall conform to 29 CFR §1910.120, "OSHA Hazardous Waste Operations Standards," and the EPA guidance document, "Standard Operating Safety Guidelines" (OSWER, 1988).

H. Following approval of the RI/FS Work Plan, or modification pursuant to Section XIV (EPA Approval of Plans and Other Submissions) of the Order, the RI/FS Work Plan shall be deemed to be incorporated into this Order by reference.

III. TASK II - COMMUNITY RELATIONS

To the extent requested by EPA, Respondent shall provide information relating to the work required hereunder for EPA's use in developing and implementing a Community Relations Plan. As requested by EPA, Respondent shall participate in the preparation of appropriate information disseminated to the public; and participate in public meetings, which may be held or sponsored by EPA, to explain activities at or concerning the Site.

IV TASK III - SITE CHARACTERIZATION (RI/FS Guidance, Chapter 3)

Following EPA's written approval or modification of the RI/FS Work Plan, pursuant to Section XIV of the Order, Respondent shall implement the provisions of the RI/FS Work Plan to characterize the nature, quantity, and concentrations of hazardous substances, pollutants, or contaminants or attributable to the Site. Respondent shall provide EPA with validated analytical data within sixty (60) days of each sampling activity, in the electronic format required by EPA at the time of submission, showing the location, medium and results. Within seven (7) days of completion of field activities, Respondent shall so advise EPA in writing. Within forty-five (45) days of submission to EPA of the final set of validated data, Respondent shall submit to EPA a Site Characterization Summary Report. Within thirty (30) days after Respondent's submittal of the Site Characterization Summary Report, or such longer time as specified in writing by EPA, Respondent shall make a presentation to EPA and the State on the findings of the Site Characterization Summary Report and discuss EPA's preliminary comments and concerns associated with the Site Characterization Summary Report. EPA may then elect to provide comments on the Site Characterization Summary Report, in which case Respondent shall amend and submit to EPA a revised Site Characterization Summary Report that is responsive to the directions in all of EPA's written comments, within thirty (30) days of receipt of EPA's comments. When approved by EPA, the Site Characterization Summary Report shall be incorporated into the RI Report.

A. As part of the RI, Respondent shall perform the activities described in this task, including the preparation of the Site Characterization Summary Report and the RI Report. The overall objective of site characterization is to describe areas of the Site that may pose a threat to human health or the environment. This is accomplished by first determining the Site's physiography, geology, and hydrology. Potential surface and subsurface pathways of migration will be defined. Respondent shall identify the sources of contamination and characterize the nature, extent, and volume of the sources of contamination, including their physical and chemical constituents as well as their concentrations at incremental locations relative to background concentrations in the affected media. Using this information, contaminant fate and transport is then estimated.

B. During this phase of the RI/FS, the QAPP, and HSP are implemented. Field data are collected and analyzed to provide the information required to accomplish the objectives of the study. Respondent shall notify EPA at least two weeks in advance of the field work regarding the planned dates for field activities, including ecological field surveys, geophysical surveys, excavation, installation of wells, initiating sampling, installation and calibration of equipment,

pump tests, and initiation of analysis and other field investigation activities. In view of the unknown conditions of the Site, activities are often iterative, and to satisfy the objectives of the RI/FS it may be necessary for Respondent to modify the work specified in the initial Work Plan. In addition to the deliverables below, Respondent shall provide a monthly progress report and participate in meetings with EPA at major milestones in the RI/FS process, as described herein at: Section IV (Task III, Site Characterization Summary Report); Section IX (Task VIII.B, Development and Screening of Remedial Alternatives Technical Memorandum); Section X (Task IX.A, Feasibility Study Report).

1. Field Investigation

The field investigation includes the gathering of data to define the Site's physical and biological characteristics, sources of contamination, and the nature and extent of contamination at the Site. These activities shall be performed by Respondent in accordance with the RI/FS Work Plan. The initial tasks of the investigation will be selected based on the results of the data collection and review described in Section II.C of this SOW. Additional investigatory tasks will then be conducted, as necessary, to characterize the Site-related contamination to the extent necessary to select an appropriate remedy. At a minimum, the Field Investigation shall address the following:

a. Implement and Document Field Support Activities

Respondent shall initiate field support activities following approval of the RI/FS Work Plan. Field support activities may include scheduling, and procuring equipment, office space, laboratory services, and/or contractors. Respondent may initiate other time critical field support activities, such as obtaining access to the site and determining substantive permit requirements for field activities, prior to approval of the RI/FS Work Plan.

Respondent shall provide EPA with reasonable notice prior to initiating field support activities so that EPA may adequately schedule oversight tasks. Respondent shall also notify EPA in writing upon completion of field support activities.

b. Investigate and Define Site Physical and Biological Characteristics

Respondent shall collect data on the physical and biological characteristics of the Site and its surrounding areas including the physiography, geology, and hydrology, and specific physical characteristics identified in the Work Plan. This information will be ascertained through a combination of physical measurements, observations, and sampling efforts and will be utilized to define potential transport pathways and human and ecological receptor populations. In defining the physical characteristics of the Site, Respondent shall also obtain sufficient engineering data for the projection

of contaminant fate and transport, and development and screening of remedial action alternatives, including information to assess treatment technologies.

c. Define Sources of Contamination

Respondent shall define sources of contamination, focusing on potential hot spots and/or source areas, such as areas of highly toxic and/or highly mobile material that may pose a potential threat to human health or the environment. For each such location, the aerial extent and depth of contamination shall be determined by sampling at incremental depths on a sampling grid or by other sampling means of frequency, as defined in the RI/FS Work Plan. The physical characteristics and chemical constituents and their concentrations will be determined for all known and discovered sources of contamination. Respondent shall conduct sufficient sampling to define the boundaries of the contaminant sources to the level established in the QA/QC plan and Data Quality Objectives (DQOs).

Defining the source of contamination will include analyzing the potential for contaminant release (e.g., long term leaching from soil), contaminant mobility and persistence, and characteristics important for evaluating remedial actions, including information to assess treatment technologies.

d. Describe the Nature and Extent of Contamination

Respondent shall gather information to describe the nature and extent of contamination during the Field Investigation. To describe the nature and extent of contamination, Respondent shall utilize the information on the Site's physical and biological characteristics and sources of contamination to give a preliminary estimate of the contaminants that may have migrated. Respondent shall then implement an iterative monitoring program and any study program identified in the RI/FS Work Plan (which includes the QAPP) such that by using analytical techniques sufficient to detect and quantify the concentration of contaminants, the migration of contaminants through the various media at the Site can be determined. In addition, Respondent shall gather data for calculations of contaminant fate and transport. This process is continued until the area and depth of contamination are known to the level of contamination established in the QA/QC plan and DQOs. The information on the nature and extent of contamination will be used to determine the level of risk presented by the Site. Respondent shall use this information to help to determine aspects of the appropriate remedial action alternatives to be evaluated.

2. Data Analysis

Evaluate Site Characteristics

Respondent shall analyze and evaluate the data to describe: (1) physical and biological characteristics at the Site, (2) contaminant source characteristics, (3) nature and extent of contamination and (4) contaminant fate and transport. Results of the Site's physical characteristics, source characteristics, and extent of contamination analyses are utilized in the analysis of contaminant fate and transport. The evaluation will include the actual and potential magnitude of releases from the sources, and horizontal and vertical spread of contamination as well as mobility and persistence of contaminants. Where modeling is appropriate, such models shall be identified to EPA in a technical memorandum prior to their use. All data and programming, including any proprietary programs, shall be made available to EPA together with a sensitivity analysis. Analysis of data collected for characterization of the Site will meet the DQOs developed in the QA/QC plan (or revised during the RI).

3. Data Management Procedures

Respondent shall consistently document the quality and validity of field and laboratory data compiled during the RI.

a. Document Field Activities

Information gathered during characterization of the Site will be consistently documented and adequately recorded by Respondent in field logs and laboratory reports. The method(s) of documentation must be specified in the Work Plan and QAPP. Field logs or dedicated field log-books must be utilized to document observations, measurements, and significant events that have occurred during field activities. Laboratory reports must document sample custody, analytical responsibility, analytical results, adherence to prescribed protocols, nonconformity events, corrective measures, and/or data deficiencies.

b. Maintain Sample Management and Tracking

Respondent shall maintain field reports, sample shipment records, analytical results, and QA/QC reports to ensure that only validated analytical data are reported and utilized in the risk assessment and evaluation of remedial alternatives. Analytical results developed under the Work Plan must be accompanied by, or cross- referenced to, a corresponding QA/QC report when included in the Site Characterization Summary Report for the Site. In addition, Respondent shall safeguard

chain-of custody forms and other project records to prevent loss, damage, or alteration of project documentation.

4. Site Characterization Summary

As described in the beginning of this Section of the SOW, Respondent shall prepare and submit to EPA a concise Site Characterization Summary Report that shall be incorporated into the RI Report. This report will review the investigative activities that have taken place, and describe and display data from the Site documenting the location and characteristics of surface and subsurface features and contamination at the Site including the affected medium, location of any identified source area/hot spot, its physical state, and concentration of contaminants. In addition, the location, approximate dimensions, the physical condition of the hot spot and/or source area, and varying concentrations of each contaminant throughout each hot spot and/or source area and the extent of contaminant migration through each of the affected media will be documented. The Site Characterization Summary Report for the Site will provide EPA with a preliminary reference for the development of the risk assessment, and evaluation of the development and screening of remedial alternatives and the refinement and identification of ARARs. Respondent shall agree to discuss any data gaps identified by the EPA and, as determined by EPA to be necessary, collect data required to support the completion of the baseline risk assessment. (See "Guidance for Data Useability in Risk Assessment" - Publication # 9285.7-09A, April 1992.) Also, this evaluation shall include any information relevant to characteristics of the Site necessary for evaluation in the baseline risk assessment with respect to the need for remedial action and for the development and evaluation of remedial alternatives. (See Risk Evaluation of Remedial Alternatives (Part C) - OSWER Directive 9285.7-01C, December 1991.)

5. Fate and Transport Model Memorandum

At EPA's request, Respondent shall submit a memorandum on a fate and transport model, unless it can demonstrate to EPA's satisfaction that such a model is unnecessary. If EPA determines that a fate and transport model is required and so notifies Respondent, Respondent shall, within forty-five (45) days thereafter, submit the memorandum on the model. This memorandum shall detail how a three dimensional (3-D) groundwater flow and contaminant transport model will depict migration of the Site's contaminants within the groundwater flow regime of the Site. EPA may provide comments on the submitted memorandum, in which case Respondent shall amend and submit to EPA a revised memorandum that is responsive to the directions in all EPA comments within thirty (30) days of receipt of EPA's comments.

6. Reuse Assessment

At EPA's request, Respondent shall perform a Reuse Assessment. If EPA determines that a Reuse Assessment is required and so notifies Respondent, Respondent shall, within forty-five (45) days thereafter, submit the Reuse Assessment. The Reuse Assessment should provide sufficient information to develop realistic assumptions of the reasonably anticipated future uses for the Site. Respondent shall prepare the Reuse Assessment in accordance with EPA guidance including, but not limited to, "Reuse Assessment: A Tool to Implement the Superfund Land Use Directive," OSWER Directive 9355.7-06P, June 4, 2001, or subsequently issued guidance. EPA may provide comments on the submitted Reuse Assessment, in which case Respondent shall amend and submit to EPA a revised assessment that is responsive to the directions in all EPA comments within thirty (30) days of receipt of EPA's comments.

V. TASK IV - IDENTIFICATION OF CANDIDATE TECHNOLOGIES

Schedule: An Identification of Candidate Technologies Memorandum shall be submitted by Respondent within forty-five (45) days of Respondent's submission to EPA of the last set of final validated analytical data. The candidate technologies identified shall include innovative treatment technologies (as defined in the RI/FS Guidance) where appropriate. The listing of candidate technologies will cover the range of technologies required for alternatives analysis. Respondent shall conduct a literature survey to gather information on performance, relative costs, applicability, removal efficiencies, operation and maintenance (O&M) requirements, and implementability of candidate technologies. EPA may provide comments on the submitted memorandum, in which case Respondent shall amend and submit to EPA a revised memorandum which is responsive to the directions in all EPA's written comments within twenty-one (21) days of receipt of EPA's comments.

If EPA determines that practical candidate technologies have not been sufficiently demonstrated, or cannot be adequately evaluated for this Site on the basis of available information, EPA may require that treatability testing be conducted, as described in Task V.

VI. TASK V - TREATABILITY STUDIES; AS NECESSARY

Treatability testing will be performed by Respondent, as necessary, to assist in the detailed analysis of alternatives. The following activities will be performed by Respondent.

A. Evaluate Treatability Studies

Once a decision has been made to perform treatability studies, Respondent and EPA will decide on the type of treatability testing to use (e.g., bench versus pilot). Because of the time required to design, fabricate, and install pilot scale equipment as well as perform testing for various operating conditions, the decision to

perform pilot testing should be made as early in the process as possible to minimize potential delays of the FS.

B. Treatability Testing Work Plan

Within forty-five (45) days of EPA's written determination that treatability testing is necessary and the decision on the type of treatability testing to be used, Respondent shall submit a Treatability Testing Work Plan, including a field sampling and analysis plan and a schedule. EPA will either approve of the Treatability Testing Work Plan pursuant to Section XIV (EPA Approval of Plans and Other Submissions) of the Order, or will provide comments on the plan. Within thirty (30) days of receiving EPA's comments on the Treatability Testing Work Plan, Respondent shall prepare a revised plan that is responsive to the directions in all EPA's written comments. Respondent shall submit the revised Treatability Testing Work Plan to EPA for approval pursuant to Section XIV (EPA Approval of Plans and Other Submissions) of the Order, unless Respondent is directed otherwise by EPA in writing. Upon its approval by EPA, said Treatability Testing Work Plan and schedule shall be deemed incorporated into this Order by reference.

The Treatability Testing Work Plan shall describe the background of the Site, remedial technology (ies) to be tested, test objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety, and residual waste management. The DQOs for treatability testing should be documented as well. If pilot scale treatability testing is to be performed, the pilot-scale Work Plan will describe pilot plant installation and start-up, pilot plant operation and maintenance procedures, operating conditions to be tested, a sampling plan to determine pilot plant performance, and a detailed health and safety plan. If testing is to be performed off-site, Respondent shall address all necessary permitting requirements to the satisfaction of appropriate authorities.

C. Treatability Testing QAPP

If the original QAPP is not adequate for defining the activities to be performed during the treatability test, a separate Treatability Testing QAPP, or amendment to the original QAPP for the Site, will be prepared by Respondent for EPA review and approval, and will be submitted at the same time as the Treatability Testing Work Plan.

EPA will either approve of the revised QAPP pursuant to Section XIV (EPA Approval of Plans and Other Submissions) of the Order, or will provide comments on the QAPP. Within thirty (30) days of receiving EPA's comments on the Treatability Testing QAPP, Respondent shall prepare a revised QAPP that is responsive to the directions in all EPA's written comments. Respondent shall

submit the revised Treatability Testing QAPP to EPA for approval pursuant to Section XIV (EPA Approval of Plans and Other Submissions) of the Order, unless Respondent is directed otherwise by EPA in writing.

D. Treatability Testing HSP

If the original HSP is not adequate for defining the activities to be performed during the treatment tests, a separate or amended HSP will be developed by Respondent and submitted for EPA review and comment. Task 1 of this Statement of Work provides additional information on the requirements of the health and safety plan. EPA does not "approve" the treatability testing HSP.

E. Treatability Testing Evaluation Report

Within forty-five (45) days of completion of any treatability testing, Respondent shall submit a Treatability Testing Evaluation Report to EPA. EPA may provide comments on the report, in which case Respondent shall amend and submit to EPA a revised Treatability Testing Evaluation Report that is responsive to the directions in all EPA's written comments, within thirty (30) days of receiving EPA's comments.

The Treatability Testing Evaluation Report shall analyze and interpret the testing results. Depending on the sequences of activities, this report may be a part of the RI/FS Report or a separate deliverable. The report will evaluate each technology's effectiveness, implementability, cost and actual results as compared with predicted results. The report will also evaluate full scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

VII. TASK VI - BASELINE RISK ASSESSMENT

Respondent shall prepare a Baseline Risk Assessment for the Site which shall be incorporated by Respondent into the RI. Respondent shall provide EPA with the following deliverables:

A. Baseline Human Health Risk Assessment (BHHRA)

1. Actual and potential cancer risks and non-cancer hazards to human health shall be identified and characterized in accordance with CERCLA, the NCP, and EPA guidance documents including, but not limited to, the RI/FS Guidance, "Land Use in the CERCLA Remedy Selection Process" (OSWER Directive No. 9355.7-04) and the definitions and provisions of "Risk Assessment Guidance for Superfund ("RAGS")," Volume 1, "Human Health Evaluation Manual," (December 1989) (EPA/540/1-

89/002). Other EPA guidance to be used in the development of risk assessments is provided in Attachment 1 to this SOW.

2. Memorandum on Exposure Scenarios and Assumptions
Within sixty (60) days after approval or modification of the RI/FS Work Plan pursuant to Section XIV (EPA Approval of Plans and Other Submissions) of the Order, Respondent shall submit a Memorandum describing the exposure scenarios and assumptions, taking into account for the BHHRA the present and reasonably anticipated future land use of the Site. The Memorandum should include appropriate text describing the conceptual site model and exposure routes of concern for the Site, and include a completed RAGS Part D Table 1. This table shall describe the pathways that will be evaluated in the BHHRA, the rationale for their selection, and a description of those pathways that will not be evaluated. In addition, the Memorandum shall include a completed RAGS Part D Table 4 describing the exposure pathway parameters with appropriate references to EPA's 1991 Standard Default Assumptions and updated guidance developed by EPA. EPA may provide comments on the Memorandum, in which case Respondent shall amend and submit to EPA a revised Memorandum that is responsive to the directions in all EPA's written comments, within thirty (30) days of receiving EPA's comments.

3. Pathway Analysis Report (PAR)
Respondent shall prepare and submit a PAR within sixty (60) days after Respondent's submission to EPA of the last set of validated data. The PAR shall be developed in accordance with OSWER Directive 9285.7-01D dated January 1998 (or more recent version), entitled, "*Risk Assessment Guidelines for Superfund Part D*" and other appropriate guidance in Attachment 1 and updated thereto. The PAR shall contain the information necessary for a reviewer to understand how the risks at the Site will be assessed. The PAR will build on the Memorandum on Exposure Scenarios and Assumptions (see VII.A.2 above) describing the risk assessment process and how the risk assessment will be prepared. The PAR shall include completed RAGS Part D Tables 2, 3, 5, and 6 as described below. EPA may provide comments on the PAR, in which case Respondent shall amend and submit to EPA a revised PAR that is responsive to the directions in all EPA's written comments within thirty (30) days of receipt of EPA's comments. The PAR must be reviewed and approved by EPA prior to the submission of the draft BHHRA. The following information shall be included in the PAR:

a. Chemicals of Concern (COC). The PAR shall contain all the information necessary for a reviewer to understand how the risks at the Site will be evaluated.

i. Based on the validated analytical data Respondent shall list the hazardous substances present in all sampled media (e.g., groundwater, soils, sediment, etc.) and the contaminants of potential concern ("COPCs") as described in RAGS Part A.

ii. Table 2 - Selection of COCs. Representative contaminants and associated concentrations in sample media for the PAR shall be determined utilizing all currently available media-specific validated analytical data generated during the RI/FS. The selection of COCs shall follow RAGS Part A and before chemicals are deleted as COCs they shall be evaluated against the residential PRGs from Region IX. The COCs shall be presented in completed RAGS Part D Table 2 format.

b. Table 3 - Media Specific Exposure Point Concentrations. Using the chemicals selected in Table 2, this Table shall summarize the Exposure Point Concentrations for all COCs for the various media. The calculation of the Exposure Point Concentration shall follow the Supplemental Guidance to RAGS: Calculating the Concentration Term (1992), using EPA's ProUCL 4.0 (2007) Software, which evaluates the distribution of the data using Shapiro-Wilk's and Lilliefor's tests, in accordance with 2003 ProUCL's User's Guide. In those cases where the 95% Upper Confidence Limit (UCL) exceeds the mean, the maximum concentration shall be used as the Exposure Point Concentration.

c. Tables 5 and 6 - Toxicological Information. This section of the PAR shall provide the toxicological data (e.g., Cancer Slope Factors, Reference Doses, Reference Concentrations, Weight of Evidence for Carcinogens, and adjusted dermal toxicological factors where appropriate) for the chemicals of concern. The toxicological data shall be presented in completed RAGS Part D Tables 5 and 6. The sources of data in order of priority are:

- Tier 1 – Integrated Risk Information System (IRIS) database (EPA, 2007).
- Tier 2 – Provision Peer Reviewed Toxicity Values (PPRTV) – The Office of Research and Development/National Center for Environmental Assessment/Superfund Health Risk Technical Support Center (STSC) develops PPRTVs on a chemical specific basis when requested by EPA's Superfund program. Provisional values will either be obtained from the most

recent Reg. IX PRG tables or Reg. III RBC tables or from Reg. II.

- Tier 3 – Other Toxicity Values – Tier 3 includes additional EPA and non-EPA sources of toxicity information. Priority will be given to those sources of information that are the most current, the basis for which is transparent and publicly available and which have been peer reviewed. Tier 3 values include toxicity values obtained from CalEPA, Agency for Toxic Substances and Disease Registry's (ATSDR's) Minimum Risk Levels (MRLs) and toxicity values obtained from the HEAST (EPA 1997 b).

To facilitate a timely completion of the PAR, Respondent shall submit a list of chemicals for which IRIS values are not available to EPA as soon as identified thus allowing EPA to facilitate obtaining this information from EPA's National Center for Environmental Assessment.

4. Baseline Human Health Risk Assessment of the RI Report.

Within sixty (60) days of EPA's approval of the PAR, Respondent shall submit to EPA a Draft Baseline Human Health Risk Assessment (BHHRA) for inclusion in the RI. The submittal shall include completed RAGS Part D Tables 7 through 10 summarizing the calculated cancer risks and non-cancer hazards and appropriate text in the risk characterization with a discussion of uncertainties and critical assumptions (e.g., background concentrations and conditions). Respondent shall perform the BHHRA in accordance with the approach and parameters described in the Memorandum of Exposure Scenarios and Assumptions and the PAR, as described above. Text and tables from these reports previously reviewed by EPA shall be included in the appropriate sections of the BHHRA.

EPA may provide comments on the draft BHHRA, in which case Respondent shall amend and submit to EPA a revised report that is responsive to the directions in all EPA's written comments, within thirty (30) days of receiving EPA's comments. Upon approval by EPA, the revised BHHRA shall be incorporated into the RI Report.

B. Baseline Ecological Risk Assessment

1. Within sixty (60) days after Respondent's submission to EPA of the last set of validated data, Respondent shall submit a Screening-Level Ecological Risk Assessment (SLERA) in accordance with current Superfund ecological risk assessment guidance (Ecological Risk

Assessment Guidance for Superfund, Process for Designing and Conducting Ecological Risk Assessments [ERAGS], USEPA, 1997 [EPA/540-R-97-006], OSWER Directive 9285.7-25, June 1997)). The SLERA shall include a comparison of the maximum contaminant concentrations in each media of concern to appropriate conservative ecotoxicity screening values, and should use conservative exposure estimates. EPA will review the SLERA and determine whether a full Baseline Ecological Assessment is required. EPA may provide comments on the SLERA, in which case Respondent shall amend and submit to EPA a revised SLERA that is responsive to the directions in all EPA's written comments, within twenty-one (21) days of receiving EPA's comments.

2. If EPA determines that a full Baseline Ecological Risk Assessment (BERA) is required, and so notifies Respondent in writing, Respondent shall, within forty-five (45) days thereafter, submit a Scope of Work outlining the steps and data necessary to perform the BERA, including any amendments to the RI/FS Work Plan required to collect additional relevant data. If EPA provides comments on the BERA Scope of Work, Respondent shall amend and submit to EPA a revised BERA Scope of Work that is responsive to the directions in all EPA's written comments within twenty-one (21) days of receipt of EPA's comments. The BERA Scope of Work shall identify any RI/FS Work Plan amendments or addenda, including establishment of a schedule for review and approval of additional field work, subject to EPA approval pursuant to Section XIV (EPA Approval of Plans and Other Submissions) of the Order.

3. Respondent shall notify EPA in writing within ten (10) days of completion of all field activities associated with the BERA, as identified in the BERA Scope of Work and performed under the approved RI/FS Work Plan addenda. Within sixty (60) days of submission to EPA of the final set of BERA-related validated data, Respondent shall submit a draft BERA Report to EPA for inclusion in the RI Report. Actual and potential ecological risks shall be identified and characterized in accordance with CERCLA, the NCP, and EPA guidances including, but not limited to, "Ecological Risk Assessment Guidance for Superfund, Process for Designing and Conducting Ecological Risk Assessments," (1997) (EPA/540-R-97-006), ERAGS, dated June 5, 1997 (or most recent guidance). Respondent shall evaluate and assess the risk to the environment posed by Site contaminants. As part of this subtask, Respondent shall perform the following activities:

   a. Draft BERA Report. Respondent shall prepare a draft BERA Report that addresses the following:

i. Hazard Identification (sources). Respondent shall review available information on the hazardous substances present at the Site and identify the major contaminants of concern.

ii Dose-Response Assessment. Respondent shall identify and select contaminants of concern based on their intrinsic toxicological properties.

iii. Characterization of Site and Potential Receptors. Respondent shall identify and characterize environmental exposure pathways.

iv Select Chemicals, Indicator Species, and End Points. In preparing the assessment, Respondent shall select representative chemicals, indicator species (species which are especially sensitive to environmental contaminants), and end points on which to concentrate.

v. Exposure Assessment. The exposure assessment shall identify the magnitude of actual or environmental exposures, the frequency and duration of these exposures, and the routes by which receptors are exposed. The exposure assessment shall include an evaluation of the likelihood of such exposures occurring and shall provide the basis for the development of acceptable exposure levels. In developing the exposure assessment, Respondent shall develop reasonable maximum estimates of exposure for both current land use conditions and potential land use conditions at the site.

vi. Toxicity Assessment/Ecological Effects Assessment. The toxicity and ecological effects assessment shall address the types of adverse environmental effects associated with chemical exposures, the relationships between magnitude of exposures and adverse effects, and the related uncertainties for contaminant toxicity.

vii. Risk Characterization. During risk characterization, chemical-specific toxicity information, combined with quantitative and qualitative information from the exposure assessment, shall be compared to measured levels of contaminant exposure levels and/or the levels predicted through environmental fate and transport modeling. These comparisons shall determine whether concentrations of

contaminants at or released from the Site are affecting or could potentially affect the environment.

viii. Identification of Limitations/ Uncertainties. Respondent shall identify critical assumptions (e.g., background concentrations and conditions) and uncertainties in the report.

ix. Site Conceptual Model. Based on contaminant identification, exposure assessment, toxicity assessment, and risk characterization, Respondent shall revise the Conceptual Site Model discussed in Section II.F. of this SOW, as appropriate.

b. Final BERA Report. Within thirty (30) days of receiving EPA's written comments on the draft BERA Report, Respondent shall amend and submit to EPA a final BERA Report that is responsive to the directions in all EPA's written comments. Upon approval by EPA, the final BERA shall be incorporated into the RI Report

VIII TASK VII - REMEDIAL INVESTIGATION REPORT

Respondent shall prepare a Remedial Investigation (RI) Report that accurately establishes the site characteristics such as the contaminated media, extent of contamination, and the physical boundaries of the contamination. This report shall summarize results of field activities to characterize the Site, sources of contamination, and the fate and transport of contaminants. Pursuant to this objective, Respondent shall obtain only the minimum essential amount of detailed data necessary to determine the key contaminants movement and extent of contamination. The key contaminants are selected based on persistence and mobility in the environment and the degree of hazard. Respondent shall use existing standards and guidelines such as drinking water standards, water quality criteria, and other criteria accepted by EPA as appropriate for the situation, which will be used to evaluate effects on human receptors who may be exposed to the key contaminants above appropriate standards or guidelines. The RI Report will incorporate information presented in the approved Site Characterization Summary Report, the BHHRA Report and, if required, the BERA Report.

The RI Report shall be written in accordance with the "Guidance for Conducting Remedial Investigations/Feasibility Studies under CERCLA," OSWER Directive 9355.3-01, October 1988, Interim Final (or latest revision) and "Guidance for Data Usability in Risk Assessment," (EPA/540/G-90/008), September 1990 (or latest revision).

Respondent shall refer to the RI/FS Guidance for an outline of the report format and contents. Following comment by EPA, Respondent shall prepare a final RI Report which incorporates EPA's comments, pursuant to Section XIV (EPA Approval of Plans and Other Submissions) of the Order.

A. Draft Remedial Investigation Report

Within sixty (60) days of Respondent's submission of the revised BERA or submission of the BHHRA, whichever is later, Respondent shall submit a draft RI Report.

B. Final Remedial Investigation Report

Within sixty (60) days of receiving EPA's comments on the Draft RI Report, Respondent shall amend and submit to EPA a final RI Report that is responsive to the directions in all EPA's written comments.

IX TASK VIII- DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES

Concurrent with the RI site characterization task (Task III of this SOW), Respondent shall begin to develop and evaluate remedial action objectives that at a minimum ensure protection of human health and the environment. The development and screening of remedial alternatives shall identify and develop an appropriate range of remedial action objectives. This range of alternatives should include options in which treatment is used to reduce the toxicity, mobility, or volume of wastes, including, at a minimum, the principal threats posed by the Site, but that vary in the types of treatment, the amount treated, and the manner in which long-term residuals or untreated wastes are managed; options involving containment with little or no treatment; options involving both treatment and containment; and a no-action alternative. The following activities will be performed as a function of the development and screening of remedial alternatives.

A. Development and Screening of Remedial Alternatives

1. Develop Remedial Action Objectives

   Respondent shall develop medium-specific or operable-unit specific goals for protecting human health or the environment, specifying COCs, exposure route(s) and receptor(s) and preliminary remedial goals.

2. Develop General Response Actions

   Respondent shall develop general response actions for each medium of interest defining containment, treatment, excavation, pumping, or other actions, singly or in combination to satisfy the remedial action objective.

3. Identify Areas or Volumes of Media

   Respondent shall identify areas or volumes of media to which general response actions may apply, taking into account requirements for

protectiveness as identified in the remedial action objectives. The chemical and physical characterization of the site will also be taken into account.

4. Assemble and Document Alternatives

Respondent shall assemble selected representative technologies into alternatives for each affected medium or operable unit.

Together, all of the alternatives will represent a range of treatment and containment combinations that will address either the Site or the operable unit(s) as a whole. A summary of the assembled alternatives and their related action-specific ARARS will be prepared by Respondent for inclusion in the Development and Screening of Remedial Alternatives Technical Memorandum.

The reasons for eliminating alternatives during the preliminary screening process must be specified.

5. Refine Alternatives

Respondent shall refine the remedial alternatives to identify contaminant volume addressed by the proposed process and sizing of critical unit operations as necessary. Sufficient information will be collected for an adequate comparison of alternatives. PRGs for each chemical in each medium will also be modified as necessary to incorporate any new risk assessment information presented in the baseline risk assessment report. Additionally, action-specific ARARs will be updated as the remedial alternatives are refined.

6. Conduct and Document Screening Evaluation of Each Alternative

Respondent may perform a final screening process based on short and long term aspects of effectiveness, implementability, and relative cost. Generally, this screening process is only necessary when there are many feasible alternatives available for detailed analysis. If necessary, the screening of alternatives will be conducted to assure that only the alternatives with the most favorable composite evaluation of all factors are retained for further analysis. As appropriate, the screening will preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives will include options that use treatment technologies and permanent solutions to the maximum extent practicable.

B. Development and Screening of Alternatives Deliverables

Within forty-five (45) days after EPA's approval of the Baseline Risk Assessment (the latter of the BHRRA or BERA), or within forty-five (45) days after EPA's approval of Respondent's Treatability Testing Evaluation Report (if treatability studies are undertaken), whichever is later, Respondent shall submit a Development and Screening of Remedial Alternatives Technical Memorandum summarizing the work performed in, and the results of, each task above, including an alternatives array summary. The Memorandum shall also summarize the reasoning employed in screening, arraying alternatives that remain after screening, and identifying the action-specific ARARs for the alternatives that remain after screening. The Memorandum shall also provide an explanation for choosing any institutional or engineering controls as part of any remedial alternative, and the level of effort that will be required to secure, maintain, and enforce the control. Within twenty-one (21) days after submission of the Memorandum, Respondent shall make a presentation to EPA identifying the remedial action objectives and summarizing the development and preliminary screening of remedial alternatives. EPA may elect to comment on the Memorandum. If required by EPA's comments, the remaining alternatives will be modified by Respondent to assure that a complete and appropriate range of viable alternatives are identified and considered in the detailed analysis. Unless otherwise specified by EPA, changes made in response to EPA's comments shall be incorporated in Feasibility Study (FS) Report. This deliverable will document the methods, rationale, and results of the alternatives screening process.

C. Detailed Analysis of Remedial Alternatives

The detailed analysis will be conducted by Respondent to provide EPA with the information needed to allow for the selection of a remedy for the Site. This analysis is the final task to be performed by Respondent during the FS.

1. Detailed Analysis of Alternatives

Respondent shall conduct a detailed analysis of alternatives which will consist of an analysis of each option against a set of nine evaluation criteria and a comparative analysis of all options using the same evaluation criteria as a basis for comparison.

2. Apply Nine Criteria and Document Analysis

Respondent shall apply nine evaluation criteria to the assembled remedial alternatives to ensure that the selected remedial alternative will be protective of human health and the environment; will be in compliance with, or include a waiver of, ARARS; will be cost-effective; will utilize permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable; and will address the statutory preference for treatment as a principal element. The evaluation criteria include: (1) overall protection of human health and the

environment; (2) compliance with ARARs; (3) long-term effectiveness and permanence; (4) reduction of toxicity, mobility, or volume; (5) short-term effectiveness; (6) implementability; (7) cost; (8) state (or support agency) acceptance; and (9) community acceptance.

For each alternative, Respondent should provide: (1) a description of the alternative that outlines the remedial strategy involved and identifies the key ARARs associated with each alternative, and (2) a discussion of the individual criterion assessment. If Respondent does not have direct input on criteria (8) state (or support agency) acceptance and (9) community acceptance, these will be addressed by EPA.

3. Compare Alternatives Against Each Other and Document the Comparison of Alternatives

Respondent shall perform a comparative analysis between the remedial alternatives. That is, each alternative will be compared against the others using the evaluation criteria as a basis of comparison. Identification and selection of the preferred alternative are reserved by EPA. Respondent shall incorporate the results of the comparative analysis in the Feasibility Study Report.

X. TASK IX - FEASIBILITY STUDY REPORT

A. Respondent shall prepare a Feasibility Study (FS) Report consisting of a detailed analysis of the remedial alternatives, in accordance with the National Contingency Plan (NCP), 40 CFR Part 300, as well as the most recent guidance. Within sixty (60) days of EPA's approval of the Development and Screening of Remedial Alternatives Technical Memorandum pursuant to Section XIV of the Order, Respondent shall submit to EPA a Draft FS Report which reflects the findings in the approved Baseline Risk Assessment. Respondent shall refer to the RI/FS Work Plan and the RI/FS Guidance and this SOW for report content and format. Within fourteen (14) days after submission of the draft FS Report, Respondent shall make a presentation to EPA and the State at which Respondent shall summarize the findings of the draft FS Report and discuss EPA's preliminary comments and concerns, if any, associated with the draft FS Report. EPA will either approve of the submittal pursuant to Section XIV (EPA Approval of Plans and Other Submissions) of the Order, or will provide comments on the draft FS Report. Within forty-five (45) days of receiving EPA's comments on the draft FS Report, Respondent will submit a revised FS Report that is responsive to the directions in all EPA's written comments. Respondent shall then submit the revised document to EPA for approval pursuant to Section XIV (EPA Approval of Plans and Other Submissions) of the Order, unless Respondent is directed otherwise by EPA in writing.

B. The FS report shall include the following:

1. Summarize Feasibility Study objectives
2. Summarize remedial action objectives
3. Articulate general response actions
4. Identification and screening of remedial technologies
5. Remedial alternatives description
6. Detailed analysis of remedial alternatives
7. Summary and conclusions

Respondent's technical feasibility considerations shall include the careful study of any problems that may prevent a remedial alternative from mitigating site problems. Therefore, the site characteristics from the RI must be kept in mind as the technical feasibility of the alternative is studied. Specific items to be addressed are reliability (operation over time), safety, operation and maintenance, ease with which the alternative can be implemented, and time needed for implementation.

ATTACHMENT A

REFERENCES FOR CITATION

The following list, although not comprehensive, comprises many of the regulations and guidance documents that may apply to the RI/FS process:

The National Hazardous Substance and Oil Pollution Contingency Plan, 40 CFR 300 *et seq.*

"Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive No. 9355.3-01

"Interim Guidance on Potentially Responsible Party Participation in Remedial Investigation and Feasibility Studies," U.S. EPA, Office of Waste Programs Enforcement, Appendix A to OSWER Directive No. 9355.3-01.

"Guidance on Oversight of Potentially Responsible Party Remedial Investigations and Feasibility Studies," U.S. EPA, Office of Waste Programs Enforcement, OSWER Directive No. 9835.3.

"A Compendium of Superfund Field Operations Methods," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.

"EPA NEIC Policies and Procedures Manual," May 1978, revised November 1984, EPA-330/9-78-001-R.

"Data Quality Objectives for Remedial Response Activities," U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-7B.

"Guidelines and Specifications for Preparing Quality Assurance Project Plans," U.S. EPA, Office of Research and Development, Cincinnati, OH, QAMS-004/80, December 29, 1980.

"EPA Requirements for QAPPs for Environmental Data Operations," U.S. EPA, Office of Emergency and Remedial Response, QA/R-5, October 1998.

"Interim Guidelines and Specifications for Quality Assurance Project Plans," U.S. EPA, Office of Emergency and Remedial Response, QAMS-005/80, December 1980.

"Users Guide to the EPA Contract Laboratory," U.S. EPA, Sample Management Office, August 1982.

"Interim Guidance with Applicable or Relevant and Appropriate Requirements," U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.

"CERCLA Compliance with Other Laws Manual," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (draft), OSWER Directive No. 9234.1-01 and -02.

"Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites," U.S. EPA, Office of Emergency and Remedial Response, (draft), OSWER Directive No. 9283.1-2.

"Draft Guidance on Superfund Decision Documents," U.S. EPA, Office of Emergency and Remedial Response, March 1988, OSWER Directive No. 9355.-02

"Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual" (Part A), EPA/540/1-89/002

"Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual" (Part B), EPA/540/R-92/003.

"Risk Assessment Guidance for Superfund - Volume II Environmental Evaluation Manual," March 1989, EPA/540/1-89/001.

"Guidance for Data Useability in Risk Assessment," October, 1990, EPA/540/G-90/008.

"Performance of Risk Assessments in Remedial Investigation/ Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs)," August 28, 1990, OSWER Directive No.9835.15.

"Risk Evaluation of Remedial Alternatives" (Part C), December 1991, OSWER Directive 9285.7-01C.

"Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions," April 22, 1991, OSWER Directive No. 9355.0-30.

"Supplemental Guidance to RAGS: Calculating the Concentration Term," May 1992, OSWER Directive 9285.7-081.

"Health and Safety Requirements Employed in Field Activities," U.S. EPA, Office of Emergency and Remedial Response, July 12, 1981, EPA Order No. 1440.2.

OSHA Regulations in 29 CFR 1910.120 (Federal Register 45654, December 19, 1986).

"Interim Guidance on Administrative Records for Selection of CERCLA Response Actions," U.S. EPA, Office of Waste Programs Enforcement, March 1, 1989, OSWER Directive No. 9833.3A.

"Community Relations in Superfund: A Handbook," U.S. EPA, Office of Emergency and Remedial Response, June 1988, OSWER Directive No. 9230.03B.

"Community Relations During Enforcement Activities And Development of the Administrative Record," U.S. EPA, Office of Programs Enforcement, November 1988, OSWER Directive No. 9836.0-1a.

HUMAN HEALTH RISK ASSESSMENT GUIDANCE DOCUMENTS

Superfund Risk Assessment Guidance

USEPA, 1989, Risk Assessment Guidance for Superfund (RAGS); Volume I Human Health Evaluation Manual Part A. OERR. EPA/540/1-89/002. Available at: http://www.epa.gov/superfund/programs/risk/ragsa/index.htm

USEPA, 1990, Risk Assessment Guidance for Superfund (RAGS); Volume I, Human Health Evaluation Manual, (Part B, Development of Risk-Based Preliminary Remediation Goals) OERR, EPA/540/R-92/003.

Available at: www.epa.gov/superfund/programs/risk/ragsb/index.htm

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS); Volume I, Human Health Evaluation Manual (Part C, Risk Evaluation of Remedial Alternatives), OSWER Directive 9285.7-01C, December 1991. Available at: www.epa.gov/superfund/programs/risk/ragsc/index.htm

USEPA, 1996. Revised Policy on Performance of Risk Assessments During Remedial Investigation/Feasibility Studies (RI/FS) Conducted by Potentially Responsible Parties, OSWER Directive No. 9340.1-02 mistakenly numbered 9835.15c.

USEPA, 1997. Risk Assessment Guidance for Superfund (RAGS); Volume I, Human Health Evaluation Manual, Part D., OERR, Interim Publication No. 9285.7-01D. Available at: www.epa.gov/superfund/programs/risk/ragsd/index.htm

USEPA, 1999. Risk Assessment Guidance for Superfund (RAGS). Volume I, Community Involvement in Superfund Risk Assessments. OSWER 9285.7-01, EPA540-R-98-042, PB-99-96303, March 1999. Available at: www.epa.gov/superfund/programs/risk/ragsa/c1_ra.pdf.

Exposure Factors

USEPA, 1991, RAGS Volume I: Human Health Evaluation Manual Supplemental Guidance. Standard Default Exposure Factors. OSWER Directive 9285.6-03. March 25, 1991.

USEPA, 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. OSWER 9285.7-081. May 1992.

USEPA, 1997. Exposure Factors Handbook - Final, Office of Health and Environmental Assessment, Washington, D.C. Available at: www.epa.gov/ncea/exposfac.htm.

Dermal Exposure

USEPA, 1992. Dermal Exposure Assessment: Principles and Applications. OSWER. EPA/600/8-91/011B. January. Available at: http://www.epa.gov/ncea/dermal.htm.

USEPA, 1999. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual: (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Guidance, OSWER Directive 9285.7-10. Please contact Region II risk assessors to discuss any potential updates to the factors in this guidance.

Toxicity and Chemical Specific Guidance

USEPA, current version. Integrated Risk Information System (IRIS); On-line Service. Available at: www.epa.gov/iris).

USEPA, 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. EPA/600/R-93/C89. July 1993.

USEPA, 1996. PCBs: Cancer dose-response assessment and application to environmental mixtures. EPA/600/P-96/001A. Available at: http://www.epa.gov/ncea/pcbs.html.

USEPA. 1997. Health Effects Assessment Summary Tables (HEAST), FY'97 Update. U. S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. EPA/540-F-97-036. July 1997.

Risk Characterization Guidance

USEPA 1995. Memorandum from Carole Browner on Risk Characterization, U.S. EPA, February 22, 1995. Available at: http://www.epa.gov/ordntrnt/ORD/spc/2riskchr.html.

USEPA, 1995. EPA Risk Characterization Program. Memo from Administrator Carol Browner dated March 21, 1995. Available at: http://www.epa.gov/ordntrnt/ORD/spc/2riskchr.html.

Risk Assessment Guidelines and Policies

USEPA, 1986. Risk Assessment Guidelines for Mutagenicity Risk Assessment. 51 Federal Register 34006, September 24, 1986.

USEPA, 1986. Risk Assessment Guidelines for Chemical Mixtures 51 Federal Register 34014, September 24, 1986.

USEPA, 1992. Risk Assessment Guidelines for Exposure Assessment. Federal Register. Available at: http://www.epa.gov/nceawww1/exposure.htm

USEPA, 1995. Neurotoxicity Cancer Guidelines. Federal Register. 60 FR 52-32-52056, October 4, 1995.

USEPA, 1996. Proposed Guidelines for Carcinogen Risk Assessment. EPA/600/P-92/003C. Available from: http://www.epa.gov/ORD/WebPubs/carcinogen/.

USEPA, 1996. Guidelines for Reproductive Toxicity Risk Assessment. EPA/630/R-96/009, September 1996. Available at: http://www.epa.gov/ORD/WebPubs/repro/.

USEPA, 1996. Proposed Guidelines for Carcinogen Risk Assessment. EPA/600/P-92/003C, April 1996. Available at: http://www.epa.gov/ORD/WebPubs/carcinogen.

Data Useability and Quality

USEPA, 1992. Final Guidance on Data Useability in Risk Assessment (Part A), OSWER Directive 9285.7-09A., June 1992. Available at: www.epa.gov/programs/risk/datause/parta.htm.

USEPA, 1992. Guidance for Data Useability in Risk Assessment (Part B), OSWER Directive 9285.7-09B, August 1992. Available at: www.epa.gov/programs/risk/datause/partb.html.

USEPA, 1993. Data Quality Objectives Process for Superfund, Interim Final Guidance. OSWER Publication 93559-01, EPA 540-R-93-071.

Air

USEPA, 1989. Air/Superfund national Technical Guidance Study Services, Volumes I-IV, EPA 450/1-89/001, 002, 003, 004, July 1989.

Soil

USEPA, 1993. Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities. OSWER Directive #9355.4-12.

USEPA, 1996. Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soils. Available at: http://www.epa.gov/superfund/programs/lead/prods.htm.

USEPA, 1996. Soil Screening Guidance, Fact Sheet. EPA 540/F-95/041. Available at: www.epa.gov/superfund/resources/soil/index.htm#fact.

USEPA, 1996. Soil Screening Guidance: User's Guide. EPA Doc. # 540/R-96/018, July 1996.

Available at: www.epa.gov/superfund/resources/soil/

USEPA, 1996. Final Soil Screening Guidance, and Associated Appendices. May 17, 1996. Soil Screening Guidance User's Guide, EPA 540/R-96/018. Available at: www.epa.gov/superfund/resources/soil/

USEPA, 1996. Soil Screening Guidance: Technical Background Document (TBD). EPA Document Number: EPA/540/R-95/128, July 1996
Available at: www.epa.gov/superfund/resources/soil/.

Lead

USEPA, 1994. Technical Support Document for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (December 1994) [NTIS #PB94-963505, OSWER #9285.7-22]. Software available at: http://www.epa.gov/superfund/programs/lead/prods.html.

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